

trees, dwarf trees and shrubs, trees and shrubs with handsome fruits, handsome-barked trees and shrubs, variegated and coloured trees and shrubs, fine-foliaged trees and shrubs, autumnal colour in trees and shrubs, early- and late-flowering trees and shrubs, street planting, hedges, trees and shrubs for wet places, shrubs for dry positions and poor soils, shrubs for shady places, and trees and shrubs for the seaside.

All the necessary general information upon each subject is given in a clear and concise manner, but special details of culture required by individual plants are given later in the descriptive part of the work. The early part of the book will appeal specially to the purely practical man, but the more important part, which commences at page 113 of vol. i., and is continued to the end of the second volume, will be found to be of value to everyone who is interested in hardy ligneous plants, whether from the point of view of the botanist, student, landowner, gardener, or forester. Descriptions are given of all the species of trees and shrubs, so far identified, which are of any importance in the British Isles, with many of the most distinct botanical varieties, and in almost every case the descriptions have been prepared from living plants in the Kew collections. The arrangement of genera and species is, as far as possible, alphabetical, this arrangement only being altered where two species are very closely allied, and the distinguishing features can be more clearly defined when the descriptions run concurrently. An ample index of some forty pages, however, atones for this little digression.

One system of description obtains throughout the work. The name of each genus appears in large capitals with the order to which it belongs in small capitals. Then follows a general description of the genus with distribution and special cultural directions. The principal species are then described, each description being headed by the scientific and common names, and, when necessary, the chief synonyms, together with an indication as to where a good botanical drawing of the plant can be found. The following description gives an idea of the general style of the work:—

L. TRAGOPHYLLA, *Hemsley*. CHINESE WOODBINE.
(Bot. Mag., t. 8064.)

A deciduous climbing shrub, with smooth young shoots. Leaves oval, tapering about equally to both ends; 2 to $4\frac{1}{2}$ ins. long, $\frac{3}{4}$ to 2 ins. wide; slightly glaucous above, glaucous and slightly downy beneath. The uppermost pair of leaves are wholly united by their bases, forming a diamond shape; the next pair lower down are less united, but still clasp the stem;

still lower down come short-stalked leaves. Flowers bright yellow, produced in a terminal head of ten to twenty. Corolla-tube $2\frac{1}{2}$ to $3\frac{1}{2}$ ins. long, slenderly cylindrical, smooth outside, downy within; across the two lips the corolla measures 1 in. or more in width. Berries red.

Native of the province of Hupeh, China; discovered by Henry and introduced for Messrs. Veitch by Wilson in 1900. It flowered for the first time at Coombe Wood, in July, 1904. L. Caprifolium is closely related, but differs in its whorled flowers and in the smooth interior of the corolla-tube. L. tragophylla is the largest flowered and most showy of the true honeysuckle (*Periclymenum*) group. It likes a deep moist loam, and Mr. Wilson recommends for it a semi-shaded position.

It will thus be seen that the descriptions are clear, concise, and ample for all practical purposes. Botanical terms have been avoided whenever possible, but in such a work they could not be excluded, and for the benefit of readers who are unfamiliar with such terms an excellent glossary precedes the commencement of part ii.

Mr. Bean's intimate connection with the Kew collections for upwards of a quarter of a century, coupled with his keen powers of observation and critical knowledge of everything connected with hardy ligneous plants, offer a sufficient guarantee for the thorough trustworthiness of the book, and it should find a place in the library of every lover of trees and shrubs, whilst nurserymen and others would do good work, and indirectly pay a graceful compliment to the author, by adopting it as the national standard of nomenclature.

The publisher has done his share in a manner worthy of the firm, and Mr. E. J. Wallis and Miss E. Goldring are to be complimented upon the photographs and drawings. Both author and publisher are to be congratulated upon the production of a book which is likely to be the standard work upon trees and shrubs for at least half a century.

W. DALLIMORE.

FIRST PRINCIPLES OF MATHEMATICS.

Neue Grundlagen der Logik, Arithmetik und Mengenlehre. By Julius König. Pp. viii + 259. (Leipzig: Veit and Co., 1914.) Price 8 marks.

THIS is an interesting and very readable book which, with a comparatively small amount of new notation, discusses the elements of the theory of sets. The most original section is that on "logical forms"; this is a theory of induction more or less corresponding to Whitehead and Russell's theory of types, and axioms of reducibility. The most controversial chapter is that on Zermelo's axiom, and the principle of selection; here the author is very ingenious, but, we fear, not very convincing. Given a class ($a, b, c, \dots$) he treats the term " a or b or c or $\dots$," that is (nearly)

in ordinary language, "any arbitrary element of the class" as a definite object. He quite rightly observes that this is not an element of the class; but he goes on to say, "In spite of this 'or,' 'a or b or . . . ' is a clear experience of our thinking." Of course it is for certain small finite sets, but if we try to extend it, as the author does, to infinite sets, there seems to be a risk of begging the question at issue in the theory of selections. What we want is to justify, and generalise, so far as we can, such expressions as "take an arbitrary point on the given circle," "take an arbitrary prime number," and so on.

These two examples are of the same type, but they will serve to show part of the difficulty of the question. When a circle is drawn, few would object to the postulate "It is possible to choose an arbitrary point on the circle," it seems so obvious intuitively. But now consider the set of primes, and suppose them arranged in order of magnitude; the millionth of them is a definite existent prime, but what do I mean by "taking" it? I cannot take it in the same sense as I can take two or three or 101, because it has not, so far as I know, been calculated; so I must consider "taking" it as specifying it by a description, belonging to it and to nothing else. But what is there in the general definition of a class to enable us to take an element of it, in the sense required for the theory of selections? How can I "take," for instance, an arbitrary sound or colour? What sort of set (mathematically) is that of pure musical tones? Can we arrange all periodic sounds ordinally? and so on.

It is rash for an outsider to intrude upon such a thorny topic, but we cannot help surmising that Zermelo's axiom (or an equivalent to it) may be like the axiom of parallels in geometry; not necessarily true, but leading, if assumed, to a large body of valuable conclusions. In geometry we have practically only two alternatives to the parallel axiom; it took a long time to discover them, and the only way to disprove the truth of Zermelo's axiom is to find a case that contradicts it. Meanwhile, a safe course is to imitate Whitehead and Russell, and introduce the axiom as a working hypothesis.

It may be noticed that the author pays a warm tribute to Russell's important contributions to the theory of logic. There can be no doubt that they have done much to advance clear thinking, and avoidance of fallacies.

The work is, unfortunately, not quite complete, as the author died before finishing the last chapter. His portrait is given as a frontispiece.

G. B. M.

EGYPTIAN FOLKLORE.

Amulets, Illustrated by the Egyptian Collection in University College, London. By Prof. W. M. Flinders Petrie. Pp. x+58+plates. (London: Constable and Co., Ltd., 1914.) Price 21s. net.

PROF. PETRIE is certainly right in suggesting that the subject of Egyptian amulets is one that appeals to the reader of folklore as well as to the Egyptologist. In amulets we are dealing with magic in a concrete form, and it is a problem of no small fascination to recover the meaning which underlay the origin and use of each. It will be obvious that a wide knowledge of Egyptian religious belief is essential, if we are rightly to understand those amulets of peculiarly Egyptian origin. But where the texts fail us we are necessarily thrown back upon comparison with amulets of other races, particularly those of Central African tribes. It is here that folk-lore finds its opportunity, for it not infrequently supplies a clue to the meaning of an otherwise obscure or doubtful symbol.

In the work before us Prof. Petrie has combined both these converging lines of research in a remarkable degree. His material is mainly drawn from amulets in the University College collection, which, as the result of excavation and purchase carried out for many years, he has made as varied as possible; but he has also supplemented these with reference to examples in other collections. He has consequently been able to describe some two hundred and seventy different kinds of amulets, and his classified list, largely the result of pioneer work, places the study upon a scientific basis. Under each heading the Egyptian name is given when known, its meaning and use are suggested, varieties, periods, and material are noted, and references given to the collections where specimens occur.

In his discussion of general principles, the author is certainly right in dismissing with scant sympathy the "confidence theory" and the "faith theory," for though these undoubtedly explain the actual efficacy of amulets, they are entirely out of place as explanations of origins. By far the greater number of Egyptian amulets are most satisfactorily interpreted on the principles of sympathetic magic, or in Prof. Petrie's own phrase, by the "doctrine of Similars." The whole body of funereal magic, as practised by the ancient Egyptians, partakes of this general character, and it is but natural that amulets, whether worn by the living or the dead, should fall under the same category. It is only when we come to detailed explanation that lines of underlying